47. The privilege of collecting and removing head-loads of dead wood of the unreserved kinds for their own use and not for purposes of sale, and of collecting minor forest produce, such as honey, gum, lac, wild fruits, &c., excepting hirda and mowra, which have been strictly reserved to Government, has been conceded to the wild tribes in the forest reserves of the Mándvi Range of the Surat Division under Government Resolution No. 6445, dated 31st August 1889, Revenue Department.

48. The expenditure incurred during the year and charged in the forest accounts of the Circle upon the creation and constitution of reserved and protected forests is as under:—

		Rs.	a.	p.
(1).	Salaries and travelling allowances of Forest Settlement Officers not charged against the Forest Department ...	19,342	0	4
(2).	Salaries and travelling allowances of establishment employed under Forest Settlement Officers and charged in the forest accounts, and the contingent expenditure of the latter ...	10,451	8	4
(3).	Demarcation of forest boundaries upon the ground by the construction of special forest boundary marks ...	10,594	2	1
(4).	Compensation for land and rights	13,956	9	6
	Total ...	54,344	4	3

49. The work actually effected during the year, which is represented by the expenditure detailed above, comprises:—

(*a*) the final settlement of 862 square miles at a cost of Rs. 12·1 per square mile;

(*b*) the demarcation of 2,269 miles of forest boundary at Rs. 4·6 per mile; and

(*c*) the purchase of 2,843 acres of land for forests at Rs. 4·9 per acre.

CHAPTER II.

SURVEYS AND WORKING PLANS.

A.—SURVEYS.

50. A portion of the Topographical Survey Party of the Government of India which has been deputed to this Presidency for forest surveys under the superintendence of Colonel Pullan, B. S. C., working under the joint direction and supervision of the Survey and Settlement Commissioner, Bombay, and the Surveyor General of India, has been employed throughout the year in the Northern Circle in the Collectorates of Thána, Násik, Poona and Sátára; and the nature and extent of the work performed by the surveyors will be seen in the following detailed statement:—

No.	District.	Táluka.	Triangulation.	Traverse.	Topographical or Detail Survey.		
					16"	8"	4"
1	North Thána ...	Sálsette	...	34·80	...	...	...
		Bassein	...	298·23	...	...	...
2	South Thána ...	Karjat	43	127·1	...	38·58	...
		Kalyán	50	55·86	...	10·14	...
		Bhiwndi... ...	...	133·54	...	...	...
3	Násik	Málegaon ..	...	...	...	...	...
4	Poona	Sirúr	...	...	3·15	...	...
		Bhimthadi ..	...	...	16·33	...	...
		Khed	12	181·1	0·70	35·76	51·34
		Mával	...	...	...	...	19·00
5	Sátára	Wái	...	...	...	...	...
		Total ...	105	830·63	20·18	84·48	70·34

51. During the months of April and May 1889, the Forest Survey Party in the Northern Circle was working in Karjat Táluka of the Thána Collectorate,

where 38·58 square miles of 8″ survey were completed, and in the Mával Táluka of the Poona District also in which 19 square miles of 4″ survey were accomplished. Tertiary triangulation and traversing, in order to prepare the ground for topographical survey, was likewise carried on during the two months. Early in June field-work was closed, and the establishment returned to Poona, its headquarters station, for the rainy season, when the computation of and setting up traverses surveyed during the field season, the examination and fair-copying of traverses, and the projection of plane table for the next field season were undertaken; 19 original sections of the forests of the Wái Táluka containing an area of 88 square miles on the 4″ scale were mounted, typed and prepared for the use of the Forest Department; and 29 sections comprising forests of portions of Nándgaon and Yeola Tálukás of the Násik Collectorate, and of the Karjat and Kalyán Tálukás of the Thána District were typed and fair-drawn, and were supplied to the Forest Department. From November 1889 to the end of March 1890 one survey party was engaged in the topographical survey of the forests of the Khed Táluka of the Poona District, where the valuable teak forests have been surveyed internally upon the 8″ scale, while the remaining portions of the forests have been done upon the 4″ scale; and two sub-surveyors were deputed to survey, upon the 16″ scale, the bábul forests upon the banks of rivers in the Bhimthadi Táluka of the Poona District.

52. The following gives a comparison between the relative costs per square mile of the forest surveys on the different scales, during the year of this report and the preceding year, according to information supplied by the Superintendent of forest surveys:—

	Cost per Square Mile.			Remarks.
	16″	8″	4″	
1888-89	..	145	65	
1889-90	71	188	133	
	...	43	68	Increased cost during 1889-90.

The Superintendent attributes increased cost per square mile to the inclusion in the accounts of the year under report of charges on account of fair-drawing in arrears from the preceding year. On the other hand, it must be mentioned that no portion of the advance triangulation and traversing has yet been made use of.

53. It is a matter of great difficulty to apportion to each scale of survey, or each branch of the work, such share of the total expenditure of the forest surveys as will show with any reliability its actual cost, as the charge on account of superintendence is such a very heavy item. But experience, the result of careful observation by forest surveying officers, has shown that the cost of detailed surveying upon the 8″ scale may be taken to be not so much as Rs. 10 per square mile greater than of detailed surveying upon the 4″ scale; on the other hand, the difference of cost between the 4″ and the 2″ scales is very considerable. The reason for this being that nearly, if not quite, as much detailed survey work is required to be undertaken for the 4″ as for the 8″ scales, while on the small scale of 2″ there is no room to show anything beyond the main features of the country comprised within the map.

54. Government in their Resolution No. 11 of the 3rd January 1889, in the Revenue Department, sanctioned the 8″ scale for the survey of the valuable teak reserves in the Poona and other districts, the forests of the Thána Collectorate and other forests of real value where large scale maps are required for the purposes of working plans, while the 4″ scale has to be the standard scale for forest surveys. The valuable teak forests of the Thána and of the Deccan Collectorates are not to be found, as a rule, in large solid blocks, but they are represented mainly by long narrow strips on the hill slopes of parallel valleys, and the timber produced is not of large scantling. The interests of local supply, and other local conditions, require the working circles (French series) to be made small, so that simultaneous exploitations may be spread over the whole region, not only to serve the local and export trade to the highest extent possible, but also to

provide labour for forest villagers, as well as pasturage for village cattle within a reasonable distance of their homes. Although a square inch of 4″ map may represent 40 acres, still it must be remembered that coupes are not of uniform shape, in some places the hill side is wide, in others it narrows down to 200 or even 100 yards, and in such case on the 4″ scale the forest would almost illustrate Euclid's definition of a line. Some coupes have necessarily to be not larger than 20 acres. In the Thána Collectorate, where the forests are for the most part uniformly wooded, a mistake of 5 or 6 acres in the area of a compartment may mean Rs. 200 or Rs. 300 in the selling value. However accurate the survey may be on the 4″ scale, it is indisputable that the topographical features cannot be shown in anything like the detail they appear upon a map four times this size, *viz.*, on the 8″ scale, and for laying out coupes on the ground, and for the protection of their boundaries, and for testing and examining the position and areas of the compartments, in fact for all purposes of conservancy and works, it is clearly necessary to have a correct map, on a sufficiently large scale, to enable a supervising officer to locate a given point without having recourse to instruments: experience has shown that boundaries of compartments may, through carelessness or fraud, be marked off on the ground not in accordance with the lines indicated upon the map, and that boundary lines are sometimes fraudulently altered, such errors and deviations are more liable to occur, and are much more likely to escape detection, with a small map of the 4″ scale than with the larger map of 8″: and in the Thána Collectorate alone a loss of revenue of thousands of rupees may result. It may be claimed of the 8″ scale that it acts as security against errors, carelessness and fraud in the special circumstances of the forests of Western India to such an extent as more than compensate for the larger cost of the larger scale map. Another valuable recommendation in favour of the 8″ scale for the forests is that it is the standard scale of the Bombay Revenue Survey, and as a forest block is made up of the forest lands of different villages, it goes without saying, that the importance of having one and the same scale for the maps of the villages which have contributed to the forest block and of the latter itself must be great for administrative purposes.

55. The river side bábul reserves in the Deccan are long narrow strips covering the banks of the rivers; they are seldom over 100 yards wide, and are often barely 10 yards, and much of their area is below flood level, and they are annually swept three or four times by the river when it comes rolling down in heavy flood from the Western Ghâts, 50 to 100 miles off: to make fellings over large areas under these conditions would be madness, for the result would be erosion to an exaggerated degree. Grazing and grass cutting for local supply and for trade are important factors in the treatment of these forest lands, which have to be taken into account, for village cattle must be provided with pasturage, and the revenue obtained therefrom amounts often to from Rs. 3 to 4 per acre, per annum, while it averages Rs. 2. In view of the determining factors the system of working adopted is clean felling and subsequent plantation *in very small annual coupes, never exceeding five acres.* Thus the exposure to erosion is limited, and the power of the river is broken, while the largest possible area legitimately available is provided for the production of fodder and grazing; the smallness of the compartments and of the working circle, for the forests are in patches, demand maps upon an exceptionally large scale, while the detailed survey of these properties is so easy, there being no physical difficulties, that the relative cost between a large and a small scale is inappreciable; consequent to all these reasons Government have, in their Resolution No. 2754 of the 12th April 1889, sanctioned that the maps of the bábul reserves in the Deccan shall be produced upon the scale of 16″ equal to one mile.

56. A Sub-Division Forest Officer, who has been engaged continuously in the Thána District from the time the new system of working was introduced, in marking out coupes upon the ground and in preparing them for exploitation and in supervising the operations of the contractors or purchasers, reports his opinion upon the different values of the forest maps of the two scales, from actual experience in the use of them in carrying out his work, in the following words:—

"I am fully in accord with your opinion that maps on the 4″ scale are quite inadequate for the purpose of elaborating working plans of forests containing teak and other valuable timber, which have in view of local circumstances to be exploited by the location of coupes over a great many small areas, and where the *area* forms the basis of valuation of the

standing stock, which is sold on the system of contract cuttings. I have had much experience in Thána in the use of 4″ topographical sheets for field-work in laying out upon the ground coupes as delineated on such sheets, from which I am able to aver that for purposes of accuracy this sort of work is a mere make-shift. To find out upon the ground such a thing as a minor nulla which may be shown on this map is many a times a fruitless task; distances taken off by scale, when measured upon the ground, often give incorrect results, and the reason of this is obvious, for so small an error as a tenth of an inch in lineal measurement upon the map, means a difference upon the ground of as much as 132′, that is, a difference in area of 4 acres, one way or the other. Apart from this defect it can also be shown that the working with the 4″ maps is in the end not so cheap as the ratio of actual costs on survey operations for the 4″ and the 8″ scales would lead us to believe; at present coupes demarcated upon the ground from the 4″ maps have to be actually re-surveyed by the chain and cross staff by specially paid surveyors of the Working Plans Branch. Taking a surveyor's pay at Rs. 30 per mensem, and the expenditure on labourers he has to employ to help him at an equal sum, and the outturn of work for that period at half square mile (about 6 coupes of 50 acres each), there has to be incurred a cost of Rs. 120 per square mile, when, therefore, this item is taken into consideration, the costs on surveys on the 4″ and the 8″ scales would compare per square mile as Rs. 185*, Rs. 187 instead of as Rs. 65, Rs. 187 respectively.

* 65+120.

The resurvey of the coupes mentioned will no longer be required when the 8″ maps are available, the setting out of the coupes with their help can be carried out very expeditiously and the coupe areas as taken out by scale from the maps can, for all practical purposes be accepted with perfect reliability. With some teaching and practice Range Forest Officers, and intelligent members of the protective staff will be able to lay out coupes upon the ground as marked on maps of this large scale, and this will obviate the necessity of having a special staff of surveyors. Another great advantage would be that supervising officers will have great facility in checking the boundaries of coupes with the 8″ maps in hand."

(*B*).—WORKING PLANS.

57. The operations of the Working Plans Branch were practically confined to the two forest divisions of Thána during the year under the direction of Mr. T. B. Fry, Deputy Conservator of Forests, and the work was conducted on the lines already described in previous reports. The following is the progress statement.—

No.	Range.	Total Area.	Number of Blocks per Range.	Number of Sub-blocks laid out.	Number of Compartments laid out in 1889-90.	Average Area of a normal Compartment.	Remarks.
	North Thána Division.	Acres.					
1	Máhím	81,000	41	...	42	49	
2	Bassein	52,255	23	2	39	56	
3	Sálsette	14,641	11	...	10	36	
4	Váda	80,320	28	...	12	71	
5	Dáhánu	70,884	42	...	62	42	
6	Umbargaon ...	35,889	12	...	19	74	
	Total ...	334,989	157	2	184	328	
	South Thána Division.						
1	Kalyán	32,497	17	...	15	47	
2	Murbád	66,642	20	...	15	83	
3	Karjat	51,954	20	...	36	64	
4	Khálápur						
5	Bhiwndi	39,803	20	20	28	49	
6	Mokháda	47,540	16	...	22	74	
7	Khardi	157,812	53	...	49	74	
8	Sháhápur						
	Total ...	396,248	146	20	165	391	
	Grand Total ...	731,237	303	22	349	719	

58. In 22 forest blocks out of the 303, the first ten compartments have been marked off on the ground and demarcated with special cairns; these are shown as sub-blocks in the statement. During the year single coupes for next year's working were also demarcated in the remaining 281 blocks. A good deal of map-work in the shape of mounting and colouring to show forest reservations and the differentiation into blocks was executed during the rainy season. Mr. Fry delivered as usual a series of lectures in the College of Science, Poona, for the Forest Class students.

59. In paragraph 12 of their Resolution No. 3012, dated 2nd May 1890, on the Forest Administration Reports of the Bombay Presidency for 1888-89, Government have expressed their opinion that the Conservator should be in a position to present in future reports valuable information as to the capabilities of the Thána forests, and whether they have hitherto been under or overworked. No Forest officer who has seen the forests of the Thána Collectorate can but come to one conclusion regarding them, *viz.*, that the larger portion of them has been consistently overworked for many years before the introduction of regular working, *under the exercise of admitted privileges* of ráb and dead-wood, by the population of the country, carried on contemporaneously with exploitation for timber, &c., and with no care whatever for reproduction. The privileges have been restricted only by the physical power or convenience of the concessionaries to cut and take. Fires have prevailed and swept the forests from end to end, a considerable portion of the forests may have not been burnt in any one year, but a very insignificant portion of them has escaped from burning over a series of years. Young saplings have been ruthlessly cut over in all directions, year after year, by villagers to supply ráb material and firewood during the rains, to forest villagers, as well as outside villagers, and to be sold at bandars and railway stations as firewood to feed the export trade. Dead-wood has been manufactured wholesale for sale to dealers, who set up timber depôts at bandars and railway stations, and invited forest villagers and others to bring dead-wood to them, which they bought and exported, such dead-wood being mostly manufactured from young and maturing timber. Cattle have been allowed to graze everywhere. The trees which have been felled departmentally have not reproduced good shoots, because no sooner did the latter appear than they came within the scope of privileges and were in many cases beheaded or barked or cut down. The natural germination of seeds has produced seedlings only to be eaten by cattle or trodden under foot, for there has been no closure of sufficiently long duration. Thus the forests of the Thána District, except in out-of-the-way parts of the district, such as the Mokháda Petha, the inland villages of the Dáhánu Táluka, and in some of the small patches of the old Imperial Reserves, have been steadily deteriorating and gradually disappearing, although the outturn of timber removed on behalf of Government has been much less than it might have been, or ought to be, in proportion to the forest area, and has been a long way short of the capabilities of the forest region of the Thána Collectorate.

60. Before the introduction of the present working plans system nearly all exploitation was irregular, and no record was kept, or could be kept, of the yield, for the privilege-holders in their exploitations were not confined to any defined area determined by the capabilities of the forests, nor to any stated seasons. They went into the forests when they liked, they went where they liked, and they cut and took what they liked, so long as they openly confined themselves to the kind of trees allowed to privilege-holders, and did not act contrary to the law; and they also cut and took illicitly what they were not entitled to cut and take as often as they might think the risk of detection and of conviction and punishment was either remote or not sufficiently deterrent.

61. Until considerable progress had been made in the settlement and constitution of the forests of the Thána Collectorate under the Forest law, and until both executive and protective establishments had been increased, and also until a special working plans division had been formed, it was not possible to bring these forests under any systematic working which would provide for the exploitation of timber and other forest produce up to a volume closely approximating to, if not quite reaching, their full capabilities, and would at the same time provide remedies for the overworking and depletion going on actively in many directions.

62. The working plans of the forests of the Thána Collectorate have been arranged upon principles which will give effect to the will of the owner, or in other words will provide, as far as it is possible so to do, for the exercise by the concessionaries of those privileges which Government have ordered the people of forest villages and of other villages in the Thána District are to be allowed to enjoy. The problem set to the Forest officers to solve was to arrange the working plans of the forests upon the bases:

(*a*) that local supply must be served by allowing to forest villagers and others as much ráb material, in the shape of tree-loppings, leaves, &c., as can be supplied; by providing grazing for village cattle; by providing labour and occupation in forests: and all these were to be given within a reasonable distance of in no case extending 4 miles beyond a forest-villager's home;

(*b*) that local trade must be encouraged and developed;

(*c*) that the revenue legitimately obtainable from the forests should be realised;

(*d*) that forests must be maintained: their capabilities being preserved and enhanced.

63. A forest, it should be remembered, can only give a sustained yield of certain timbers or other articles of produce in certain relative proportions. If the forest is overworked in one kind the proceeding will reflect upon another, and eventually react upon the produce overworked; for example, if the forests are overworked for ráb material the outturn of timber and firewood will decrease, and the yield of ráb material will in time decrease also; so that there will be a smash up, or an exhaustion all round, in time.

64. In order then to comply with the conditions imposed by Government it was necessary:

i. to have the forest-blocks or working circles, French series, of restricted areas, so that the 4 miles maximum distance should be observed;

ii. to have a large number of forest blocks. There are 1,331 forest villages in the Thána Collectorate, their cultivation areas occupying the plains, while their forest areas, about 1,250 square miles in aggregate, covering the hill ranges which are on the sides of the valleys and form the water-sheds, or divides of the drainage;

iii. to have a large number of coupes in order that simultaneous exploitations should be spread over the whole forest region of the Thána District;

iv. to determine a revolution which would give for the market the kind of timber in general demand, *viz.*, small timber, firewood and charcoal; which would allow selected trees to mature; which would provide as much branches with leaves attaching to them for ráb as can be supplied; which would provide a sufficiency of grazing for village cattle; and which would at the same time keep the hill sides so well protected by tree-growth as to ensure the impounding of a torrential rainfall and the prevention of its off-flow in turbulent rush on to the rice fields in the cultivation areas below, with the removal of soil and other detritus, to impoverish the land and work other disastrous consequences.

65. Careful examination of the timber growth in the forests of the Thána Collectorate, undertaken by Mr. T. B. Fry, Divisional Forest Officer, Working Plans, and of the timber brought to private yards and departmental depôts, having shown that a rotation of forty years was the best calculated to serve *all* the interests concerned, a revolution of forty years has consequently been fixed, and the exploitable portions of the working circles, or forest-blocks, are sub-divided into forty compartments, each of which may become a coupe of the year in turn; a few seed-bearers and other maturing seedling trees of valuable species are reserved, and the remainder of the trees are sold on foot, to be felled and removed between the close of the rainy season and the end of the following April. If the coupes were to be expanded and reduced in number, they could not be worked

in one season, owing to their greater size, and to the difficulty of transporting labour, or of inducing labour to come from a long distance, the consequence would be that the forest villagers, who would not leave their homes, would prey upon the neighbouring forests for subsistence, and thus the timber prospects of future years would suffer, and forest crime and repression would be on the increase, and there would be complaints and grievances loud and long of unsatisfied local requirements; and if the timber operations of a coupe were to be extended over two or more seasons, it would be at the expense of reproduction, both by seed and shoot, in addition to the evils aforementioned. As a rule three-fourths of the compartments of a working circle are to be opened to the grazing of cattle, and ten compartments are to be closed against man and beast at one time, but in particular cases where a longer closure may be found to be required, a larger proportion of a working circle may at one time be protected against grazing or exercise of privileges.

66. It may be contended that under a shorter rotation more râb material could be provided, but any reduction in the length of the revolution will necessarily cause the expansion of the coupes, unless the number of working circles is very largely increased, which would add very considerably to the cost of supervision; and although it might augment the supply of ráb materials for a time, still it will very sensibly diminish the yield of timber and firewood, which are equally important if not more important considerations, and it will reduce the revenue derived from the forests to a very low figure, and ultimately it will reduce the supply of ráb material itself. Indeed for the service of agriculture a continuously sufficient supply of firewood is possibly of more real importance than of ráb material, for if the former were to fall short a substitute will be found as has been resorted to elsewhere, in cow dung, which is at present the mainstay for manure of rice fields in the Thána Collectorate.

67. Since the introduction of the present system of working the Thána forests, the forest revenues have steadily risen, and may be reasonably expected to rise to a much higher figure than they have yet reached, for coupes sell well, private enterprize competing to provide for local supply, and the Thána forests are a mine of wealth, the capital value of which will continue to augment. At the same time the wholesale looting of the forests which used to prevail is dying out on all sides, because that portion of the population which lived on the forests in felling, carrying and selling timber illicitly, now finds legitimate occupation on wages in the coupes all the working season round; and it has been reported to Government by their highest officers that there are practically no complaints on the part of the people of inability to obtain the satisfaction of their reasonable demands upon the forests. However even under this system the forests of Thána are in danger of being overworked by promiscuous fellings allowed outside coupes to the extent:

(a) of the trees lopped and beheaded for ráb, or ringed or cut over for dead wood removal, in exercise of conceded privileges, supplemented by the amount of mischief done by intentional firing of the forests in order to ensure a comfortable and convenient enjoyment of such admitted privileges, in all and any portion of the forests included within the working circles, but outside the coupes which represent one-fortieth of whole area of the forest region;

(b) of the damages done by fire and cattle to reproduction, more particularly in the "closed-forests," which consist of compartments which have served within the past ten years as coupes. The unlicensed and unlimited privilege of shikár is a fruitful source of such fires.

68. The condition of the Thána forests at the end of the revolution will depend entirely upon how the closed forests are treated now; while the forest revenues and the satisfaction of local wants between the present time and the end of the current revolution will depend greatly upon the interim treatment of the compartments which have not yet become coupes. The policy in past years had been to decrease the ráb-producing sources and concurrently to increase the ráb-consuming area, but under the present working plans the limits of the forest areas have been fixed once for all, and the yield of ráb material, which is after all the most active agent of forest depletion, has been defined within these limits. If the closed compartments are not effectively protected against man and beast,

and if promiscuous exploitation of timber is allowed to continue from forest areas beyond, or outside of, the annual coupes within the forest blocks, and if the shikári is allowed to roam in unregulated freedom wherever he may list, firing the forests all round him, then the maintenance of the Thána forests and the enhancement of their productive powers will continue beyond human attainment.

The Forest Department having provided the remedy for the overworking of the forests in past years by privilege-holders, it remains now for the Revenue officers to induce the rayats to take and utilise all the ráb material that is available from the coupes and to restrain them from lopping, beheading and felling any trees for ráb in any portion of the forests of a working circle outside the limits of the coupes.

69. Taking the average coupe at 50 acres a revolution of forty years gives 2,000 acres as the minimum size of the working circle, and thus the 1,250 square miles of the forests in the Thána Collectorate might be divisible into 400 working circles with 400 coupes spread over them as centres of labour and of local supply annually. But as a matter of fact the normal area of the working circle may be put at somewhat exceeding 2,000 acres, owing to the parts of the forests which are not worked but are preserved for climatic and other reasons, and also to the forest blocks in parts of the Dáhánu, Váda, Máhím and Mokháda Ranges in the wilder portion of the Thána District being comparatively large. The circumstances of the Thána Collectorate, however, are exceptional. In some other forest tracts the working circles have, through the force of local conditions which affect them, for example the riparian bábul forests on the Deccan, to be of even much smaller size than the working circles of the Thána Collectorate, but in the general run of the forests of the Northern Circle it would be neither convenient nor desirable to form such small units of working as of 1,000 or 2,000 acres. Take for example the Sátpuda forests, which cover many hundred square miles, the leased forests of the Dángs, the moist forests bordering the Syhádri range of Western Ghats, and the forests in other parts of the country where forest villages are very distant one from the other, and the population dependent upon the forests is sparse. On the other hand, where the forests and cultivation areas intermingle, so that the former consist mainly of patches and long streaks on hill sides and water-sheds, where the density of population is very great, in places amounting to even 800 to the square mile, and the demands upon the forests for pasturage and other wants are continuous and considerable, a detailed system of management is imperative, if the forests are to be maintained, and are to occupy their proper position in the harmony of the general administration of the country. Where local circumstances point to the frequency of forest-fires, and the difficulty of forest protection, in such places small and many coupes are of advantage upon the principle of not carrying all one's eggs in one basket.

70. Taking the entire reserved forest area of the Northern Circle at 4,765,585 acres, at which it stood when the year of this report opened, and adopting even so small a forest block as 2,000 acres to be the normal size of the working circle, there would be altogether 2,382 in the Northern Circle. The number may at first sight appear to be large, but when it is considered what very important interests are concerned in the preservation of the forests, and what heavy demands are made upon the forests for supplies for a teeming population, it may be urged, not unreasonably, that 2,382 centres of forest labour and local supply, and timber trade, distributed over 7,500 square miles of reserved forests, which are scattered over a territorial area of 51,501 square miles of country, are none too many. When other considerations than of revenue exercise the more potential influence upon the selection of a plan of forest management, as for example the claims of the people, and of forest villagers more particularly, upon the forests for the supply of their requirements in forest produce, in forest grazing, &c., a system of detailed management cannot well be condemned upon the grounds that it may not in this country be productive at present of so considerable a revenue, per acre, as is obtainable under the same system in Europe or elsewhere. It must be remembered that a broader system of management will not provide, if at all, certainly not to the same extent, all that is required to be provided, and therefore, will not satisfy the will of the proprietor, and will not be so conducive to the maintenance and improvement of the capital. Further

it may be urged that, the forest revenues are expanding by leaps and bounds, and that they will continue to increase, and that whereas in the forests of the Northern Circle a very large proportion of the area consists of forest lands under reboisement, a revenue from fodder grass and grazing being the chief income derivable from it, the distribution of the total forest revenues of the circle over the total forest area, in order to arrive at an average rate of revenue per acre, gives no indication whatever of the revenue which the timber-covered and timber-exploitable forests of the circle are capable of yielding, and are now returning.

71. The expenditure which has been incurred during the year upon surveys and working plans amounts to Rs. 58,040-15-4, which sum is made up of :—

Rs. 35,181-7-11 cost of the forest surveys.

Rs. 17,159-14-0 cost of Working Plans Division.

Rs. 5,699-9 5 cost of surveyors attached to the Divisional Forest Officers for preparing maps, laying out compartments in the forests, defining forest boundaries on the ground, &c.

CHAPTER III.

PROTECTION AND IMPROVEMENT.

1.—ESTABLISHMENTS.

72. The Controlling Staff of the Forest Department, Northern Circle, which consists of 1 Conservator of Forests, and 13 Deputy and Assistant Conservators of Forests, remained unchanged during the year.

73. Mr. Gleadow, Deputy Conservator of Forests, 4th grade, who had proceeded on furlough to Europe for 18 months from the 15th April 1888, returned to India, and was posted to North Thána as Divisional Forest Officer from 1st November 1889.

74. Mr. Hornidge, whose services had been placed at the disposal of the Government of India for employment in the Central Provinces, was retransferred to the Bombay Forest Department, and posted to the Sholápur Division, of which he assumed charge on the 18th October 1889.

75. Mr. Mainwaring, Deputy Conservator of Forests, 3rd grade, and Divisional Forest Officer, Ahmednagar, proceeded on furlough to Europe for one year from 5th November 1889, and Mr. Hexton, Deputy Conservator of Forests, 1st grade, and Divisional Forest Officer, Surat, availed himself of privilege leave for 2 months and 18 days from 31st January 1890.

76. The following officers also enjoyed privilege leave during the year for periods stated against them :—

Mr. R. S. F. Fagan, Deputy Conservator of Forests, 4th grade, and Divisional Forest Officer, West Khándesh, from 25th August to 24th September 1889.

Mr. C. Greatheed, Deputy Conservator of Forests, 3rd grade, and Divisional Forest Officer, Sátára, from 12th September to 26th October 1889.

77. The numerical strength and constitution of Sub-Assistant Conservators attached to the Northern Circle, underwent no change during the year. Mr. Ganesh Krishna Shaháne, who was under suspension at the close of last year, was dismissed the service under orders contained in Government Resolution No. 5320, dated 25th July 1889, for gross neglect of duty, carelessness and insubordination, for absenting himself from his charge without leave, and for several other grave charges of misconduct.

78. The sanctioned strength of permanent protective establishment, the monthly cost of which amounts to Rs. 21,503, in the several divisions of the Northern Circle, is exhibited in the following table :—